

# SHORT-TERM EFFECT OF FINE PARTICULATE MATTER (PM<sub>2.5</sub>) AND OZONE ON DAILY MORTALITY IN LISBON, PORTUGAL

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**Aim:** Determine the exposure-response relationships of ambient ozone and fine particulate matter (PM<sub>2.5</sub>) concentrations on daily mortality in Lisbon.

**Abstract:** Urban ambient air pollution exposures continue to be a global public health concern. Although air quality targets are often exceeded in Lisbon, the largest city in Portugal, there is currently no study that has assessed the quantitative impact of these pollutants on daily mortality.

In this study we conduct a time series analysis using generalized additive modeling to determine the exposure-response effect from ambient ozone (O<sub>3</sub>) and fine particulate matter (PM<sub>2.5</sub>) concentrations on daily mortality in Lisbon. The dataset used was limited to the Lisbon municipality and for the period 2004-2006.

For PM<sub>2.5</sub> exposures, we found that the relative risk for cardiovascular mortality in the population group ≥ 65 years is 2.39% (95%CI: 1.29%, 3.50%) for each 10µg/m<sup>3</sup> increase. A statistically significant cause-effect relationship for PM<sub>2.5</sub> and mortality was not observed in other population groups.

We also report O<sub>3</sub> exposures to be associated with an increase of 1.11% (95% C.I. (0.58, 1.64)) for all-cause mortality in the population group ≥ 65 years and an increase of 0.96% (95% C.I. (0.56, 1.35)) for the general population. When analyzing by cause of death, our results showed a stronger association between O<sub>3</sub> exposure and cardiovascular mortality.

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